

## ECA Update: January 6, 2016

### *In this update:*

#### **Department of Energy announces intentions for disposal of plutonium**

Augusta Chronicle

#### **One more Hanford waste tank considered emptied**

Tri-City Herald

#### **Landlocked Oak Ridge firm eyes DOE land for expansion**

Knox News

#### **New contractor operating Transuranic Waste Processing Center**

Oak Ridge Today

#### **Waste program at nuclear facility reaches milestone**

The Augusta Chronicle

#### **DOE launches K-25 Virtual Museum, helps preserve history of Manhattan Project site**

Oak Ridge Today

#### **Graphene could be used to clean up nuclear waste, say scientists**

Independent UK

#### **Department of Energy announces intentions for disposal of plutonium**

Augusta Chronicle

January 5, 2016

[LINK](#)

The Department of Energy last month issued a notice that more than 6.6 tons of surplus non-pit plutonium – some of which might currently be held at Savannah River Site – could be disposed of in New Mexico.

The joint announcement with the National Nuclear Security Administration posted to the department's Web site on Christmas Eve follows the Final Surplus Disposition Supplemental

### More Information

[About ECA](#)

[Membership](#)

[Contact Us](#)

[Helpful Links](#)

To help ensure that you receive all emails with images correctly displayed, please add [ecabulletin@aweber.com](mailto:ecabulletin@aweber.com) to your address book or contact list

[Subscribe](#)

to the  
ECA Email Server

[Online Version](#)

If you have trouble viewing this email, view the online version

[Follow @EnergyCAorg](#)  
on Twitter!

Check Out ECA's [NEW website!](#)

### Calendar

#### **State of the Union**

January 14, 2016

9:00 PM EST

Watch on

[White House website.](#)

#### **DOE Consent-Based Siting Public Meeting**

January 20, 2016

1 PM - 4 PM EST

Marriott Renaissance

Environmental Impact Statement filed in April, which mulled over the options for the disposal of 14.4 tons of surplus plutonium “for which a disposition path is not assigned.”

The preferred alternative only details intentions to prepare 6.6 tons of the surplus plutonium for disposal at the Waste Isolation Pilot Plant near Carlsbad, N.M., which is one of four options listed in the April document.

Other paths include converting the material into mixed oxide fuel at SRS’s yet-to-be-completed MOX Fuel Fabrication Facility, immobilizing the plutonium at the site’s Defense Waste Processing Facility or processing it in the H-Canyon facility.

The Department of Energy and the NNSA must wait at least 30 days before issuing a Record of Decision regarding the disposal of the material, the notice said. There is currently no preferred alternative for the remaining 7.8 tons that were “declared excess to national defense needs.”

Though the amount of plutonium stored at SRS remains classified, NNSA Press Secretary Francie Israeli said it’s possible that some of the material mentioned in the notice is either currently stored at the South Carolina site or will make its way through the facility at some point.

The notice made no mention of when the material would be transported should the two federal agencies decide to move it to New Mexico.

Israeli said the material isn’t connected to the 1,984 pounds of gap material plutonium from foreign countries set to arrive at SRS via Joint Base Charleston.

An environmental assessment posted on the Department of Energy’s Web site last week attempted to measure the impact for up to 12 total shipments, though no timeline was provided as to when those would take place.

### **One more Hanford waste tank considered emptied**

Tri-City Herald

January 2, 2016

[LINK](#)

The Department of Energy ended 2015 able to claim another one

Washington, DC,  
Downtown Hotel  
999 9th St NW,  
Washington, DC 20001

**Save the Date:**  
DOE National Cleanup  
Workshop  
September 14-15, 2016  
Hilton Alexandria Mark  
Center  
Alexandria, VA

of Hanford's leak-prone single shell tanks emptied of waste to regulatory standards. That leaves two more tanks in the group called C Tank Farm yet to be emptied of their mixtures of radioactive and hazardous chemical waste left from the past production of plutonium.

The court-enforced consent decree required that all 16 C Farm tanks, which were built during World War II, be emptied 15 months ago. A federal judge is expected to set new deadlines. The most recently emptied tank, the only one completed in 2015, is Tank C-102. Rapid progress is being made on Tank C-111. But Tank C-105 remains a problem.

Two C Farm tanks still hold waste 15 months after deadline to empty them.

Work has stalled there to demonstrate a robotic vacuum system that can be used on tanks suspected of leaking in the past. Work with the system is not expected to resume.

"It's going to be an important issue," said Jim Alzheimer, a tank engineer with the state Department of Ecology, a regulator on the project. Hanford needs a way to empty tanks that are in danger of leaking.

The vacuum system adds small volumes of liquid and quickly vacuums it up. The more commonly used sluicers use a larger volume of liquids to break up waste and move it toward a central pump.

The tally of single-shell tanks emptied to regulatory standards now stands at 15 of 149. All but one are in the C Tank Farm.

The waste is transferred to newer double-shell tanks, where it will be stored until the vitrification plant is ready to start treating the waste for permanent disposal.

The most recent tank to be emptied, C-102, had nearly 300,000 gallons of waste removed. It amounts to 95 percent of waste retrieved, although the goal is to retrieve an average of 99 percent of the waste from all single-shell tanks.

About 15,500 gallons of waste remains in Tank C-102, or about 2,100 cubic feet. The target was to get down to 360 cubic feet of waste, or the equivalent of about 1 inch of waste if it were evenly spread over the bottom of the 530,000-gallon-capacity tank.

However, the state can agree to consider a tank empty to regulatory standards when the limits of technology are reached.

“It is all pretty hard.”

Jim Alzheimer, Department of Ecology tank engineer

What remains in the enclosed, underground tank is rock hard, Alzheimer said. Some of it is sandy and some is in concrete-like chunks. The bottom of the tank is fairly clear, but there are mounds of waste on the side of the tank that have been difficult to retrieve.

Retrieval was done with an enhanced-reach sluicer starting in April 2014. The tool was lowered into the tank and then extended to get a nozzle to spray liquid as close as possible to the waste. The liquid was used to break up the waste and move it toward a pump for removal. A high-pressure water system also was used.

When possible, recycled liquid waste was used, rather than water, for the retrieval work to prevent the creation of more waste.

“There was substantial effort from the workers to plan, prepare and retrieve this radioactive waste,” said Chris Kemp, deputy DOE project director for the tank farms, in a statement.

Work is ongoing to empty Tank C-111, with about 29 percent of the waste retrieved.

“Work is going fairly quickly,” Alzheimer said. As much as 2 percent of the waste has been retrieved on some days, although cold weather slows progress because of condensation issues in the ventilation system that result in false positive sensor readings.

The tank had 35,000 gallons of waste when pumping was last done in November 2010.

Caustic was added to the tank in November to soften the waste, speeding up retrieval in December.

“It’s been a very effective way to get going,” Alzheimer said. Retrieval of waste from Tank C-105, which began in summer 2014, has been problematic.

Waste has been emptied with a Mobile Arm Retrieval System, or MARS, the largest and most robust system used to retrieve waste in Hanford’s underground tanks.

“They had been making progress, but it was very, very slow.

Jim Alzheimer, Department of Ecology tank engineer  
For the first time, MARS has been used with vacuum attachments, because Tank C-105 may have leaked in the past.

Retrieval started with little progress. Then a sluicing system was used to break through a hard crust of waste, and work then resumed on the softer waste beneath it using the vacuum system again.

“They had been making progress, but it was very, very slow,” Alzheimer said.

With retrieval about 45 percent complete and 67,000 gallons of waste remaining, the hoses used on the vacuum system failed due to heavy use.

DOE and its contractor, Washington River Protection Solutions, considered whether to fix the MARS vacuum system or remove MARS and put in enhanced reach sluicing systems, Alzheimer said.

Because the pace of work with MARS has been so slow, DOE is expected to try sluicing systems, Alzheimer said. No schedule for the work has been announced.

As work is completed on the C Tank Farm, DOE will next go to the A and AX Tank Farm.

At least two single-shell tanks are at risk of leaking during waste retrieval and could benefit from a vacuum retrieval system. One of the tanks was ruptured after high heat waste was added and an explosion occurred, Alzheimer said.

### **Landlocked Oak Ridge firm eyes DOE land for expansion**

Knox News

January 5, 2016

[LINK](#)

OAK RIDGE — A homegrown company that's in a growth mode wants to expand again, but it's presently landlocked in a full industrial park.

The Department of Energy owns land next to Bethel Valley Industrial Park, where Protomet Corp. is located, and the Oak Ridge Industrial Development Board has voted to request part of

DOE's property.

Protomet, which makes machined parts for the government and automotive industry as well as products for boats, is considering a 100,000-square-foot expansion, IDB members were told during their latest meeting.

It's an expansion with a \$15 million to \$20 million price tag and could result in the addition of 100 jobs over five years, said Parker Hardy, president of the Oak Ridge Chamber of Commerce.

"It's an immediate opportunity to help a company that's kept every promise they've made," Hardy said.

The company now has 60 employees in a 40,000-square-foot facility after an expansion celebrated in 2013 that nearly doubled its plant.

Hardy says the company is in need of 25 acres immediately, with another 10 acres eyed for its long-term strategy, plus five acres for roads and infrastructure.

The Department of Energy owns 214 acres west of the park next to Protomet, and the property runs parallel to Bethel Valley Road and beyond a DOE checkpoint for access to Oak Ridge National Laboratory.

DOE is more likely to approve a land transfer to the IDB rather than conveying it to a private company, board members were told, and the board could then make the property available to Protomet. The board on Monday authorized Chairman David Wilson to contact DOE and request the conveyance. Board member Hal Osucha urged the IDB to seek as much of the property as possible.

Hardy says while DOE now makes a payment-in-lieu-of-taxes on its property, conveying it for private-sector use would generate more tax revenue.

Oak Ridge economic development consultant Steve Jones urged a hurry-up schedule for the request, saying Protomet has a "tight schedule" for its expansion plans.

### **New contractor operating Transuranic Waste Processing Center**

Oak Ridge Today  
January 2, 2015

[LINK](#)

North Wind Solutions took over the operation of the Transuranic Waste Processing Center in west Oak Ridge in December. The Idaho-based company was awarded the \$123 million contract to operate the facility in June.

North Wind replaces Wastren Advantage Inc., which had operated the center since 2010. The Transuranic Waste Processing Center, or TRU Waste Processing Center, is off State Route 95 in southwest Oak Ridge, south of Bethel Valley Road and west of Oak Ridge National Laboratory.

North Wind will continue to process and store transuranic waste at the site until the Waste Isolation Pilot Plant, or WIPP, reopens in New Mexico. WIPP is the only facility in the U.S. that permanently disposes of transuranic waste, or TRU waste.

The Oak Ridge site, which has been open 12 years, treats legacy transuranic waste that has been in storage for many years at ORNL. That includes lab equipment or materials from research and development at ORNL and personal protective equipment.

Some of the radioactive materials are handled remotely and others in glove boxes.

The U.S. Department of Energy issued a “sources sought notice” in 2013 to begin performing market research to gauge whether there were small businesses capable of performing the work.

In December 2014, DOE environmental management officials said Oak Ridge been sending TRU waste for disposal at WIPP before two incidents in February 2014 caused a shutdown. It was sending two types of TRU: contact-handled, or CH, and remote-handled, or RH. CH TRU can be manipulated directly with proper personal protection. RH TRU is higher activity material and must be handled mechanically.

Of Oak Ridge’s original inventory of 1,500 cubic meters of CH, about 97 percent had been processed at the TRU Waste Processing Center, or TWPC, DOE officials said one year ago. About 68 percent of the inventory had been sent to WIPP. The waste is disposed at WIPP in shafts, or drifts, about a half-mile below ground in an ancient salt bed, and some of the waste has come from Oak Ridge.

Transuranic waste contains manmade elements heavier than uranium, such as plutonium, hence the name “trans” or “beyond” uranium. Transuranic waste material is generally associated with the human manipulation of fissionable material dating back to the Manhattan Project through today, and it primarily consists of clothing, tools, rags, residues, soil, and debris. The Manhattan Project was a top-secret federal program to build the world’s first atomic weapons during World War II.

### **Waste program at nuclear facility reaches milestone**

The Augusta Chronicle

January 4, 2016

[LINK](#)

The Department of Energy on Monday announced that its Defense Waste Processing Facility at Savannah River Site had poured its 4,000 canister of radioactive glass since it began operations in March 1996.

The 10 foot-tall, 2 feet-wide canister was poured Dec. 31 at the facility designed to convert “high-level radioactive liquid waste into a solid glass form suitable for long-term storage and disposal,” according to a news release.

The liquid waste used in the process is being stored in 43 underground storage tanks at the South Carolina site. The canisters would stretch more than 7.5 miles if placed end-to-end.

“Successfully immobilizing waste in glass is a technology that is important for our country,” said Savannah River Remediation president and project manager Stuart MacVean in the release. “Our work demonstrates radioactive waste can be put into a safe form, ready for disposal.”

To date, the processing facility has poured more than 15 million gallons of glassified waste, which, according to the release, has immobilized nearly 58 million curies. A curie is a unit of radioactivity.

The remaining 36 million gallons of waste at SRS is measured to have about 253 million curies.

The 4,000 canister mark means the facility, the largest operating vitrification facility in the country, is about halfway through the amount of canisters it’s expected to produce, the release said.



## **DOE launches K-25 Virtual Museum, helps preserve history of Manhattan Project site**

Oak Ridge Today

December 29, 2015

[LINK](#)

Information from the January 2016 issue of “Advocate,” a publication of the Oak Ridge Site Specific Advisory Board  
A new virtual museum helps preserve the history of the former K-25 site, which was built in west Oak Ridge to enrich uranium for atomic bombs during World War II and once had the world’s largest building under one roof.

The K-25 Virtual Museum was launched in November by the U.S. Department of Energy Oak Ridge Office of Environmental Management (OREM) as part of a memorandum of agreement for the interpretation of the historic site now known as East Tennessee Technology Park, or ETTP.

The debut of the online museum coincided with the November 10 signing of an agreement between the Department of Energy and the Department of Interior establishing the Manhattan Project National Historical Park. The Manhattan Project was a top-secret federal effort to build the world’s first atomic weapons during World War II.

The K-25 Virtual Museum can be viewed at <http://www.k-25virtualmuseum.org/>.

“The website is an impressive product that will serve to inform an international audience about the incredible work that happened at K-25, beginning with the Manhattan Project and continuing through to the cleanup mission we are executing today,” said OREM Manager Sue Cange. “The online museum includes a comprehensive history of Oak Ridge, photographs, interviews with former workers, a 3D model of the K-25 Building and Happy Valley hutment, among other items of interest.”

The Virtual Museum has several main pages that explain K-25 and the surrounding area. The home page provides the initial introduction to K-25 with links to other pages.

Additional main sections include the K-25 Site Tour and a map of all of the buildings with links explaining their various functions.

The page Life in Happy Valley describes living conditions in the self-contained community. K-25 was several miles from Oak Ridge, so Happy Valley sprang up where workers could be near their jobs.

The Preservation page describes in more detail about future site interpretation, and the Oral Histories page has many transcribed interviews with former workers.

Throughout the site are many photographs of work and life associated with K-25.

Historic preservation work at ETTP is being done independently of the Manhattan Project Park, but will be part of the park.

Efforts to preserve part of the K-25 Building were taken in the mid-2000s.

Work on historic preservation at ETTP has been underway for some time, beginning well before steps to establish the Manhattan Project Park.

Ultimately it was determined the old building was in no condition to be saved. But a final memorandum of agreement was signed in 2012 by a number of signatory and consulting parties that contained several stipulations for historic preservation of the site. The Virtual Museum was one of those stipulations.

Another stipulation was the provision of \$500,000 by DOE to be applied toward the purchase of the rapidly deteriorating Guest House in Oak Ridge. The Guest House was where many Manhattan Project VIPs stayed in the 1940s.

It was later renamed the Alexander Inn, but fell into disrepair.

Using the DOE funds, it was bought and renovated for use as an assisted living facility and is now called the Alexander Guest House. A ribbon cutting ceremony was held just a few days before the release of the Virtual Museum and the signing of the national park agreement.

Other stipulations to come include the construction of an Equipment Building that will be a scale representation of the gaseous diffusion technology used to enrich uranium. The Equipment Building will have a viewing tower that will overlook

the mile-long U-shaped footprint of K-25.

The second floor of the adjacent ETPP fire station will have a museum of Manhattan Project and K-25 artifacts and a theater.

There will be wayside markers around the K-25 footprint and other locations at ETPP.

Completion of the remaining stipulations is dependent on funding. Full establishment of the Manhattan Project Park and completion of ETPP stipulations are some time away, but for now people in the U.S. and around the world can log on to learn about K-25 and its place in history.

### **Graphene could be used to clean up nuclear waste, say scientists**

Independent UK  
December 31, 2015

[LINK](#)

Graphene, the thinnest and strongest substance known to science, could be used to help detoxify nuclear waste thanks to the latest discovery involving the wonder material.

Experiments show that it can act as a “super sieve”, able to separate different atomic isotopes of hydrogen, and create the expensive “heavy water” needed by the nuclear industry, researchers said.

Scientists use graphene to create world's smallest light bulb  
This is the first time that graphene – which consists of a crystal lattice of carbon arranged in layers just one atom thick – has been shown to act as a subatomic filter.

The findings could revolutionise the production of the heavy water composed of a rare form of hydrogen called deuterium, which is expensive to manufacture and purify with existing technology.

Graphene could also be used to clean up nuclear waste contaminated with radioactive tritium, another hydrogen isotope that can be separated by the graphene filter, the scientists said. “Essentially, graphene is the finest sieve known. It can sieve particles smaller than an atom. That is not only new but unexpected,” said Marcelo Lozada-Hidalgo of Manchester University, the first author of the study published in the journal

Science.

“Acquiring the ability to separate particles smaller than an atom using a membrane at room temperature was unthinkable even to me not long ago. I could imagine applications in biology, nuclear science, chemistry or physics.”

Graphene, which was discovered by Nobel laureates and professors Andre Geim and Kostya Novoselov, at Manchester University in 2004, has already astonished the world of materials science with its range of unusual characteristics, such as its atomic-scale thinness, extreme strength and high electrical conductivity.

Potential industrial applications range from highly flexible electronics that could be worn in clothes or used in fold-up pocket devices, to a new generation of super-fast computers and hyper-efficient solar panels.

The latest study, by a research team led by Professor Geim, discovered another novel property of graphene – its ability to filter the different atomic isotopes of hydrogen, namely tritium and deuterium, from ordinary hydrogen.

The rare form of hydrogen, deuterium, is only present in nature in very small amounts. For every 6,420 hydrogen atoms, there is just one atom of deuterium, and increasing the concentration of deuterium to make the heavy water used as a special coolant in nuclear power plants is energy intensive and expensive.

The Manchester researchers showed, however, that graphene can act as a simple filter by slowing down the movement of deuterium through a membrane made of graphene and its sister material, boron nitride. While ordinary hydrogen atoms passed straight through the sieve, deuterium was effectively blocked.

Tests showed it was possible to separate tritium and deuterium at room temperatures with high efficiency using just a fraction of the energy normally used to make heavy water. This was true even when the scientists “scaled up” the dimensions of the membrane to a few square centimetres.

This demonstrated that the graphene filter could be used for industrial purposes, such as nuclear-waste management or the production of heavy, deuterium-rich water used as a nuclear coolant, the researchers said.

“Tritium is a waste product in many nuclear reactions that needs to be safely removed from the environment. Graphene could do this efficiently. Also, heavy water is needed in nuclear power plants to contain the reactions at the core. Graphene could help to produce it cheaply,” Dr Lozada-Hidalgo told The Independent. “This is really the first membrane shown to distinguish between subatomic particles, all at room temperature. Now that we showed that it is a fully scalable technology, we hope it will quickly find its way to real applications.”

Professor Irina Grigorieva at Manchester, who co-authored the study, said: “We were stunned to see that a membrane can be used to separate subatomic particles. It is a really simple set up. We hope to see applications of these filters not only in analytical and chemical-tracing technologies, but also in helping to clean nuclear waste.”

